LLOYD'S

SOLVENCY II MODEL VALIDATION WORKSHOP 4

1 & 2 September 2011

Agenda

- Introduction: update on the Model Validation Workstream
- Validation FAQ
- Key messages on Validation
- Walkthrough findings

  Table discussions and play back

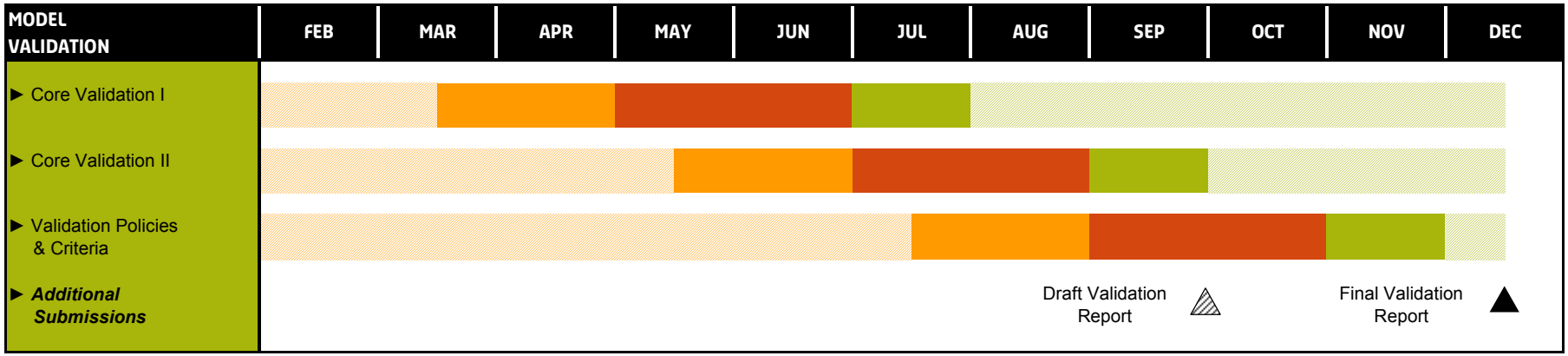
- Validation report

  Table discussions and play back/Q&A

- Wrap up

INTRODUCTION

Model Validation workstream

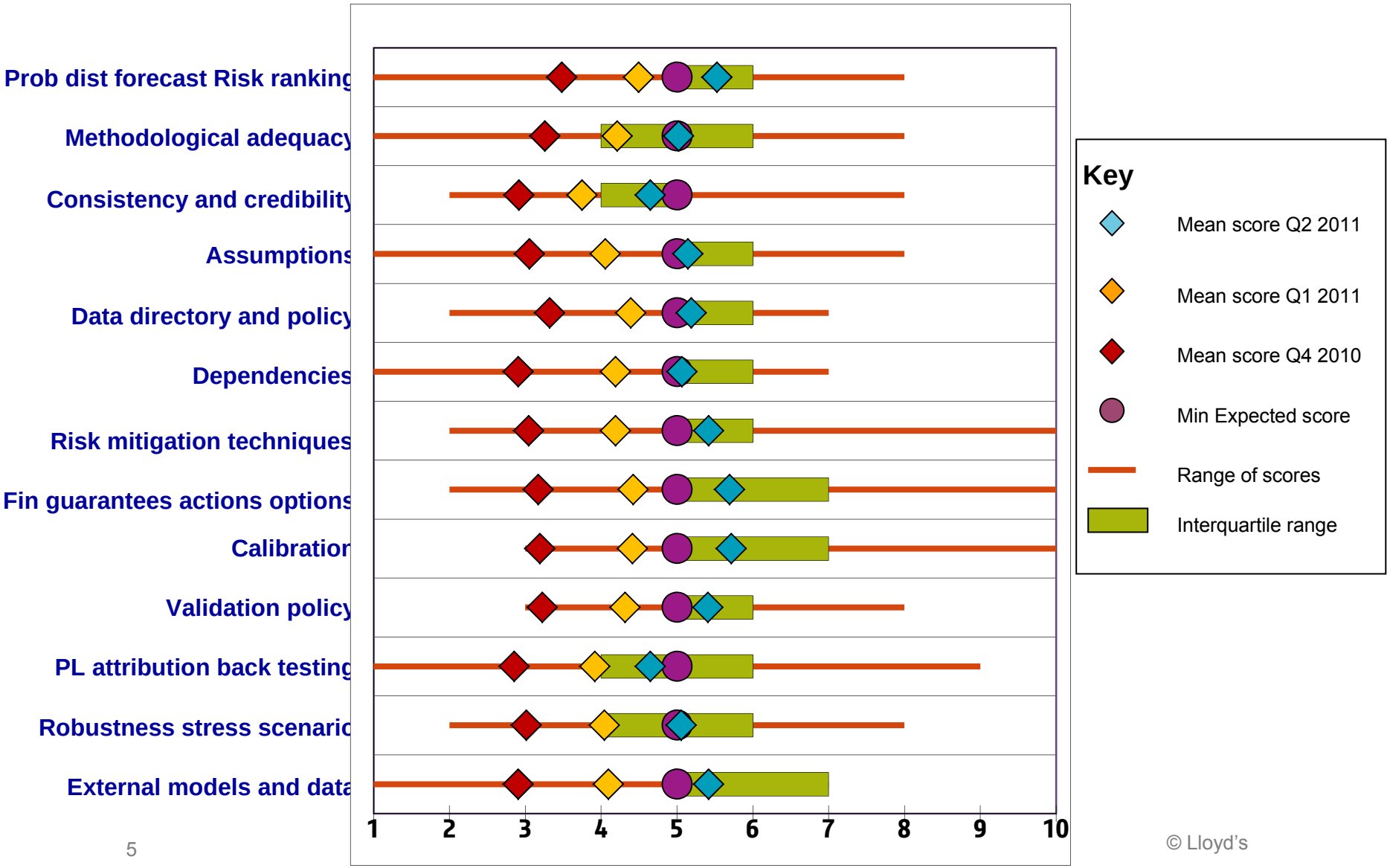


Progress to date

- Phase 2 model walkthroughs now complete – focus on validation
  - Review notes being sent out to agents for factual review
  - Feedback will be added when these are returned
- Evidence template (version 2) reviews and feedback completed
  - Version 3 submitted 26 August - last iteration ahead of FAP
- Draft validation report due 30 September

MODEL VALIDATION

Self assessment scores as at Q2 2011



VALIDATION FAQ

Appropriate methods

Q. Will Lloyd's provide us with assurances that our methods meet S2 requirements in the sense of being appropriate, not out-of-date, etc.?

A. *No, Lloyd's will **not** give "assurances" on methods and assumptions. Lloyd's **will** tell agents whether their validation justifies their methods.*

- Lloyd's will rely on agents' validation to form a view on whether their methods and assumptions are appropriate
- Lloyd's can (and will) tell agents whether our review indicates that the validation is sufficient
- The Lloyd's review therefore supplements, but does not replace, agents own work

Changes to the Internal Model

Q. Will Lloyd's require agents to make changes to their model as part of the Dry Run review? It would be helpful to know ASAP.

A. *Only in exceptional circumstances*.

- If it emerged that a key methodology or calculation could potentially lead to material mis-statements
- Lloyd's would inform the agent ASAP of their concerns
- Alternatives would be discussed
- The goal is not to enforce a Lloyd's view of best practice

Additional validation work

Q. Will Lloyd's require agents to do additional validation work or perform additional tests?

A. *Yes, if the validation review indicates that the work done is insufficient*.

- Feedback from the model walkthroughs will indicate where Lloyd's believes further validation work is needed
- Lloyd's is aware that agents face considerable time pressure – feedback will be provided as soon as possible

Next steps

Q. What will Lloyd's be doing on validation between now and year-end?

A. *Mainly three things:*

- Feedback from the model walkthroughs done to date
- Validation Report reviews
- Additional meetings with agents to review evidence and discuss issues identified

BUT…if you have ideas on how this should work, let us know

KEY MESSAGES ON VALIDATION

Top 4 ways to improve your validation

1. Think **top-down** as well as bottom-up
   - What does a board member need to know about validation?
   - Crudely, for the 3 types of risk:
     - Modelled: key methods and assumptions in plain English
     - Model limitations: weaknesses of the above
     - Non-modelled: why they're not material
   - What is the clearest way you can communicate each of these?
2. Analyse the **data** even if it's not fully credible
   - There needs to be a link between your history and the model
   - Discuss the limitations and their materiality
   - Limited data can still rule out certain assumptions or expert judgements

Top 4 ways to improve your validation

3. Provide a clear rationale for material **expert judgements**
   - Plausible explanation => expert judgement
   - No explanation => expert (?) guess

4. Discuss the **limitations** of your model
   - There is no “right” method – every one has its trade-offs
   - Justification can include comparison to weaker alternatives

KEY FINDINGS FROM THE WALKTHROUGHS

Re-cap on the validation walkthrough framework

	Identification	Materiality	Justification
Data & exposures	• Sources of risk • Examples*: missing data, latent claims, inflation, secondary perils*	• Materiality of risk source • Examples: *risk indicators, sensitivity testing, PMLs*	• Test against criteria of appropriate, accurate and complete • Examples: *impact of missing data; process to identify all cat related perils*
Assumptions & methods	• What & where used • Examples: *independence between years, future premium rates*	• Limitations of approach • Materiality of selected distributions & parameters • Examples: *unmodelled risks/perils*, *sensitivity testing*	• Tests against experience • Qualitative justification • Examples: *QQ plots, residual plots, RP tests*
Expert judgement	• What & where used • Examples: *dependency structures, risk emergence patterns*	• Materiality of judgements • Examples: *sensitivity testing, alternative distributions*	• Plausible explanations • Example: *description of drivers of dependencies*

Key messages from the walkthroughs

- **Calibration**
- **Dependencies**
- **Reserving risk**
- **Premium Ex-cat**
- **Catastrophe**
- **Market**

Walkthrough findings: positives

- Several agents have gone back to their data and derived recognition patterns from 1st principles.
- Generally speaking, there is a desire to keep methodologies transparent and straightforward.

Walkthrough findings: challenges

- The one-year risk emergence methodology is still a work-in-progress for most agents.
- There has been limited work on validation.
- Some validation issues identified by Lloyd's:
  - Limited comparison to historical experience
  - Some methods allow one-year insurance risk to exceed ultimate

Calibration validation: example (1)

- You want to backtest your risk emergence pattern for a class of business.
- You decide to compare it to historical movements in your estimated ultimate loss ratios.
- The plot below indicates that your estimated ultimates tend to decline gradually rather than vary randomly over a long term mean.

Calibration validation: example (2)

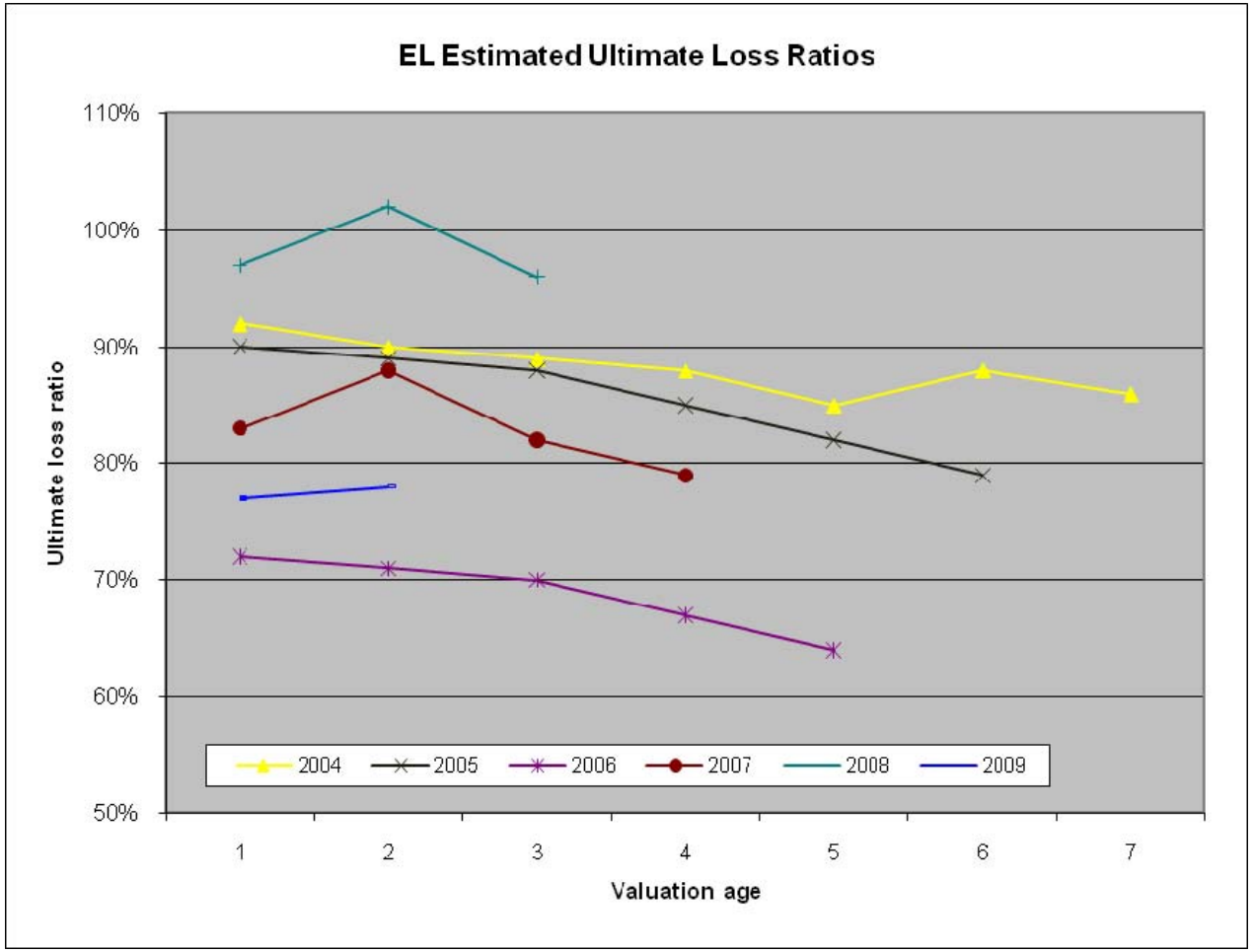


Table discussion : suggested topics

- The path of the ultimate loss ratios shown in the graph suggests over-reserving.
  - How can this be reconciled with the S2 requirement for best estimate reserving?
  - Does the data tell you anything about risk emergence?

Key messages from the walkthroughs

- Calibration
- **Dependencies**
- Reserving risk
- Premium Ex-cat
- Catastrophe
- Market

Walkthrough findings: positives

- Greater reliance by agents on business knowledge to validate dependencies between outputs
  - Comparison with reverse stress tests, RDSs, scenarios, cats, clash, etc.
- Increasing use of quantitative sense checks
  - Example: model reserve risk on a combined basis and compare with result obtained modelling separately with dependency structure

Walkthrough findings: challenges

- Expert judgement – lack of clarity on what the expert is being asked to assess and how he substantiates his views
- Heavy reliance on un-informative metrics like high/med/low correlations
  - A correlation is a statistic – it doesn't describe tail dependencies
  - It ignores the impact of direct drivers – cats, inflation, etc.
- Lack of detail for justification – either qualitative or quantitative
  - Can result in too many dependencies as well as too few
  - Example: large and attritional
    - Many agents define the large loss threshold to ensure a stable attritional loss ratio
    - So why correlate attritional and large?

Dependencies validation: example (1)

- Let's consider some of these challenges with an example.
- Suppose you have determined ULR distributions for EL and PI.
- You want the underwriter's expert judgement on an appropriate dependency structure.
- You construct a questionnaire (extract below).
- The purpose of the questionnaire is to provide the underwriter with
  - A structured format for capturing his expert judgement
  - A question on dependencies with a practical interpretation

Dependencies validation: example (2)

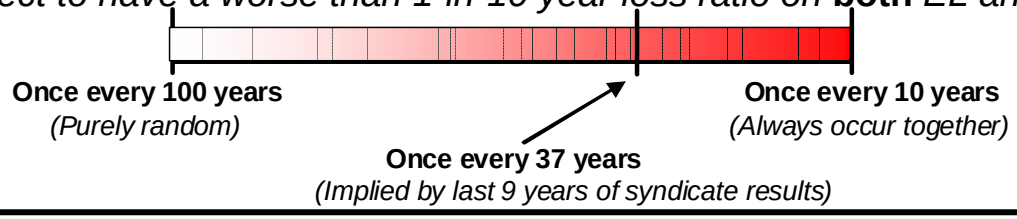
Q1	**Identification of drivers**
	Which of the following do you consider to be common drivers of results on your EL and PI portfolios?
	❑ Similar UW cycles ❑ Common policyholders with similar risk management ❑ Claims inflation ❑ Competition from same competitors for both EL and PI
Q2	**Impact of drivers**
	Which of the above would have a significant impact at high loss ratios? Why?
Q3	**Pricing decisions**
	Do you buy clash cover for EL and PI?
Q3	**Comparison with history**
	Do you think that the likelihood that EL and PI will have similar results in the next UWY is greater or less than in previous underwriting years? What are your reasons?
Q4	**Likelihood of bad results on both classes**
	How often do you expect to have a worse than 1-in-10 year loss ratio on **both** *EL and PI? Indicate on the line below.*  **Once every 100 years** *(Purely random)* **Once every 10 years** *(Always occur together)* **Once every 37 years** *(Implied by last 9 years of syndicate results)*

Table discussion: suggested topics

- How you are approaching the challenges described earlier?
- What are the advantages/ limitations of the previous example?
  - What tools could be used to validate the underwriter's return period selection?
  - What other graphics/metrics could assist in communicating dependencies?

Key messages from the walkthroughs

- Calibration
- Dependencies
- **Reserving risk**
- Premium Ex-cat
- Catastrophe
- Market

Walkthrough findings: positives

- More agents are identifying their key sources of reserve risk (certain types of claims, etc.) and taking more than one view (e.g. claims and actuarial view)
- More agents linking their view of UW and reserving risk. (How does risk decay over time?)

Walkthrough findings: challenges

- In our view, a risk type for which validation is relatively weak across the market
- Heavy reliance on the bootstrap as a “one-size-fits-all” reserving risk methodology
  - Currently used on portfolios of all types and sizes
  - It’s implausible that it’s appropriate in all cases
- Most agents said they “look at the residuals” but few were able to articulate how they interpret them.
  - Outliers vs. trends – what is the distinction?
  - If it’s a trend, what is the source? How will it affect the distribution?
  - Would another cut of the data (capped claims, excluded years) yield a better fitting model?

Bootstrap validation: example (1)

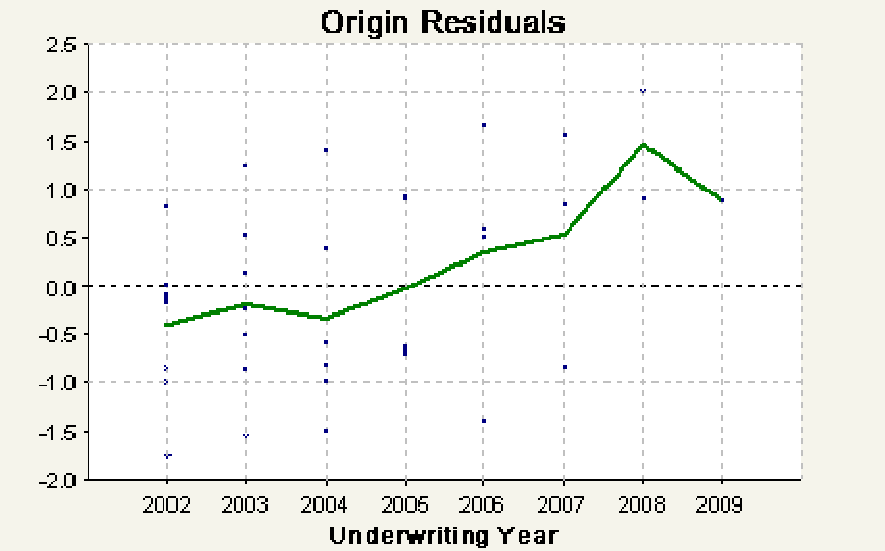
- Long-tailed casualty class with known reserving issues.
- The first set of residual plots below shows evidence of upward trends.
  - Appear to begin after CY 2008
  - Patterns imply weak support for bootstrap assumptions
- The second set of residual plots excludes residuals from the last two CY (2009 and 2010)
  - Residual pattern is more satisfactory
  - Supports the argument that 2009-2010 shows a trend

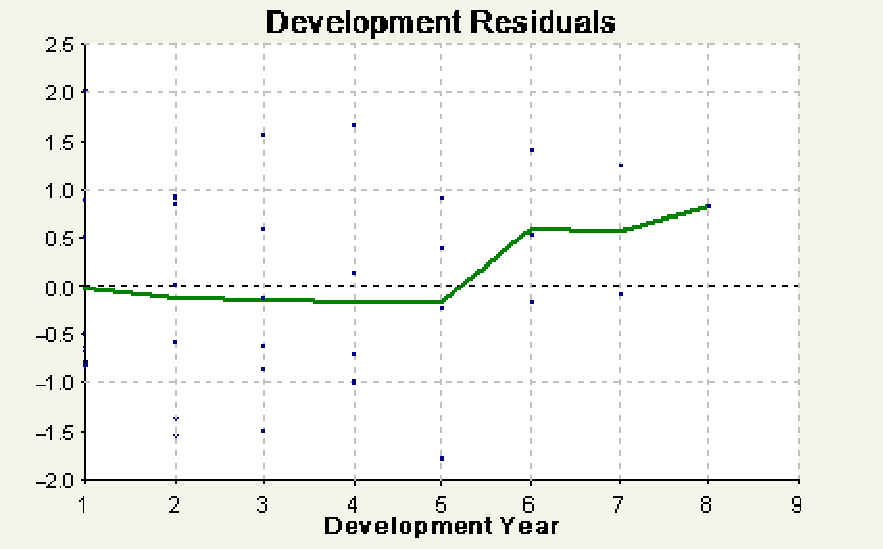
Bootstrap validation: example (2)

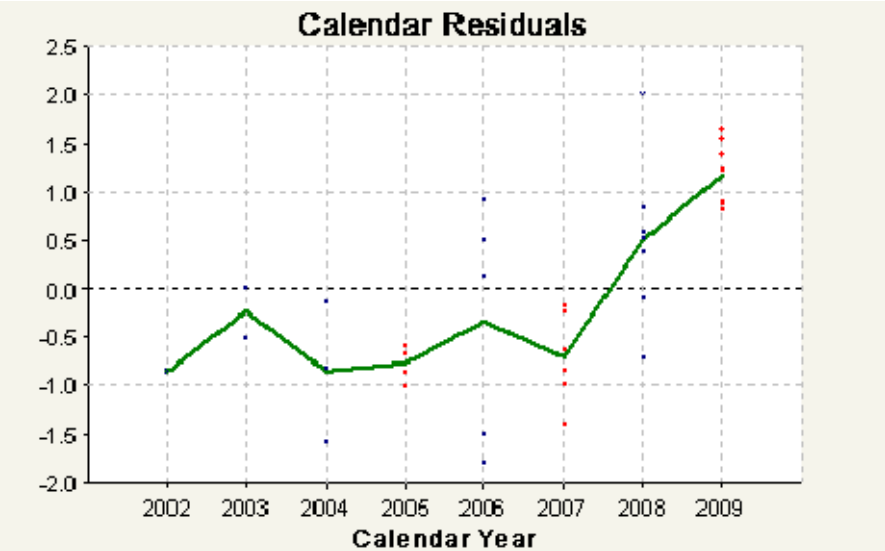
- Reserving team confirms that:
  - CY 2009 and 2010 emergence reflects a correction for under-reserving by the claims department in prior CY
  - Best estimate reserves have been adjusted and are now believed to be truly “best estimate”
  - The trend is not expected to continue

Bootstrap validation: example (3)

- Casualty class with evidence of trend in CY 2009-2010

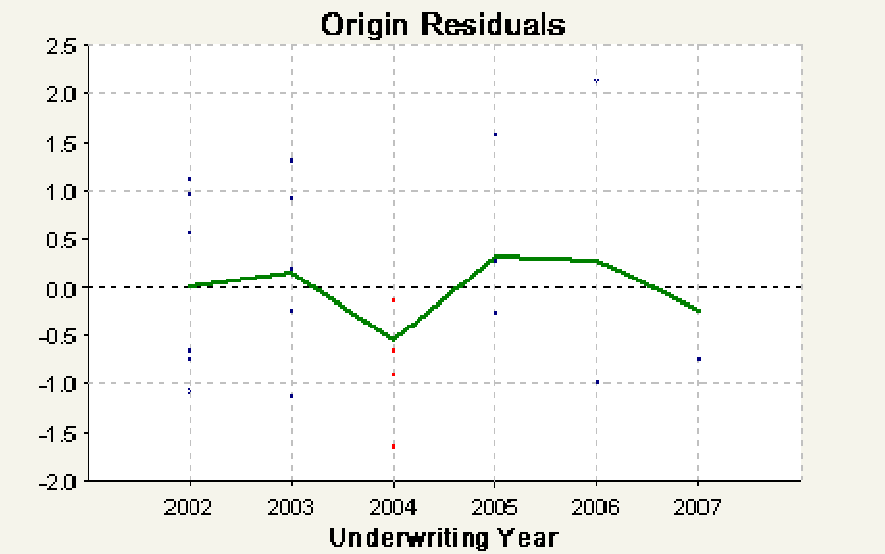






Bootstrap validation: example (4)

- Residuals excluding CY 2009 & 2010 link ratios – pattern improves



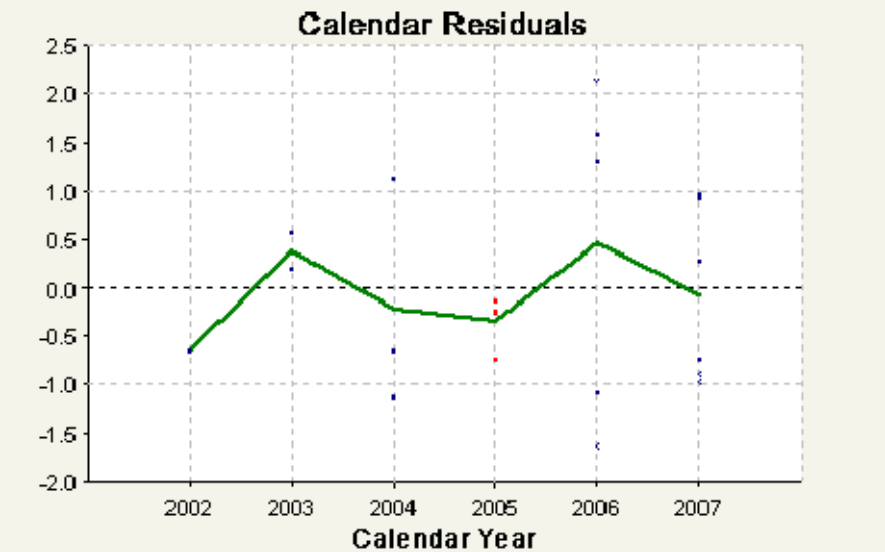


Table discussion: suggested topics

- How would you apply expert judgement to the bootstrap results to select a CoV?
  - Do you think that variability about the best estimate is higher, lower or the same as before CY 2009?
  - What if the reserving team were unsure whether the trend will continue?
- How would you validate your selection (sensitivity tests, qualitative arguments, etc.)?

Key messages from the walkthroughs

- Calibration
- Dependencies
- Reserving risk
- **Premium Ex-cat**
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Walkthrough findings: positives

- Various parts of the business are performing validation at unit level
  - business planning process, pricing, reinsurance purchasing…
- Linking capital closely to technical pricing function advances validation
- Standard statistical techniques generally in place
  - curve fitting, fitting statistics and sensitivity testing distributions & moments...
- Credit risk on reinsurance covered reasonably

Walkthrough findings: challenges

- Pulling the tests that exist at unit level into a coherent framework.
- Justifying reliance on expert judgement, especially for classes with limited data.
- Assuming ex-cat distributions include smaller cats, rare events etc without a process to validate or monitor.
- Splitting “attritional” and “large loss” without too much thought on the purpose
- Modelling risk groups driven entirely by business planning / underwriters with limited challenge or consideration on modelling of volatility.

Drivers approach to validation: example (1)

	Driver 1: Cat	Driver 2: LL	Driver 3: Economic	Driver 4: Medical inflation	Char 1: US exposed	Char 2: Primary
Class 1						
Class 2						
Class 3						
Class 4						
Class 5						

- Driver shading could be defined as where there is a significant impact on the class “expected loss” from a change in the driver.
- Where smaller classes have experience driven by common drivers and have similar characteristics, consider combining.
- Where larger classes have multiple drivers of experience and multiple characteristics, investigate whether there could is heterogeneity

Statistical approach to validation: example (2)

- Consider information from the following:
  - Payment patterns from the individual classes, looking for consistency between years, stability of pattern, differences to other groups.
  - Stability in limit profiles, average aggregate, number of MGA's
  - Cluster analysis

Qualitative approach to validation: example (3)

- An example of expert judgement around homogeneity could be:
  - A description of the business written in the class, drawing out similarities between risks and highlighting differences to others.
  - Referencing the drivers of experience to show the grouping is homogeneous for volatility modelling, not just business planning.
  - Could cover
    - Type of business
    - Geographic focus
    - Type of coverage / layer
    - Balance of cat & non cat exposure
    - Limit profile
    - Historic volatility, trends, etc

Premium ex cat: Table discussion

- What are the benefits, drawbacks and practicalities in your business of the following approaches to homogeneity:
  - Assessing the key drivers of claims experience and characteristics of the risks, to determine which risks belong together (types of inflation exposure, geographies, sensitivity to economic growth etc)
  - Reviewing statistical information on incurred and payment patterns, exhibited correlation to determine homogeneity
  - Qualitative / business / underwriter judgement
  - Using business planning classes as-is
  - Any other great ideas?

Key messages from the walkthroughs

- Calibration
- Dependencies
- Reserving risk
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- Market

Walkthrough findings: positives

- Advanced validation compared to other risk groups
- Good focus on quality of exposure data
  - e.g. use of external data checking & cleaning services
- Where agents use internally built models, backtesting to events or comparison to vendor models often in place
- Strong questioning of model output, validation from colleagues / board / Underwriters.
- Exception reporting done as part of a BAU.
- Well planned model version transition, with key milestones outlined.
- Clear demonstration of RDS understanding when questioned about the non-modelled classes, perils and correlation.

Walkthrough findings: challenges

- Lack of clear identification of perils and sources of loss including those not captured by the models
- Insufficient robustness of the expert judgement process for non-modelled perils, where naturally relying on expert judgement due to a lack of data.
- Poorly defined expert judgement feedback process i.r.o. communication between Underwriters and Cat Modelling teams.
- Weaker understanding of and adjustment for limitations of the vendor models (e.g. un-modelled perils)
- Lack of good reasoning as to why one model is chosen over another – parent company decision was quite common

Approach to Cat validation: example (1)

Territory		Australia	Australia	Chile	South Africa	Liability	Etc…
Peril		Earthquake	Windstorm	Earthquake	Earthquake	EMF(1)	
Modelled?		Yes	No	Yes	No	No	
Risk	Aggregate						
Risk 1	100						
Risk 2	200						
Risk 3	100						
Total							

- Shading represents where the risk has catastrophe exposure. Could consist of a yes/no, or a PML factor.
- Aggregation for a territory/peril across risks gives an indicator of materiality. A criterion breach indicates potential modelling required.
- Needs to be a regular process to ensure list of territories and perils are reviewed and comprehensive. Could be taken from RDS, RDL, expert judgement, loss history, near misses, policy conditions etc.

(1) Electromagnetic fields

Cat validation: table discussion

- If using the example validation tool, how would you ensure that you are picking up all perils that could be material?
- How would you extend this to pick up additional items or typically non-modelled perils such as
  - Loss amplification / demand surge
  - Loss adjustment expenses
  - Fire following
  - Storm surge
- What other approaches could be used to validate coverage?

Key messages from the walkthroughs

- Calibration
- Dependencies
- Reserving risk
- Premium Ex-cat
- Catastrophe
- **Market**

Walkthrough findings: positives

- Cover material economic exposures and materiality of the non-modelled (e.g. smaller currencies)
- Use of multi-disciplinary skills to validate the models
- Early stages of implementation probably due to the lower materiality of the risk group to most agents

Walkthrough findings: challenges

- Provision of strong validation of the ESG results
- Finalisation of implementation / initial parameterisation
- Vendor choice seems to be driven more by current relationships rather than methodology / parameterisation

Market validation: example (1)

Materiality	Present value				Duration			Interest delta
	Asset	Liability	Net		Asset	Liability		
Econ1	90	110	-20		1.5	3.0		1.9
Econ2	100	90	10		1.8	1.8		-0.2
Econ3	80	90	-10		1.0	1.5		0.5
Econ4	110	100	10		1.5	2.5		0.8
Econ5	70	60	10		2.5	3.0		0.1
Total	450	450			1.63	2.35		

- Interest delta defined as sensitivity of net position to 100bp parallel change in yield curve.
- Say approximated using

  $\Delta = PV \times (1 + int)^{duration} / (1 + int \pm 1\%)^{duration}$
- Shaded cells are possibly the material ones, according to some definition.

Market validation: example (2)

Validation			
Return period	Percentile	Capital	Implied parallel shift (bp)
1/4	75.0%	10	50
1/10	90.0%	25	130
1/20	95.0%	40	190
1/40	97.5%	60	260
1/100	99.0%	80	330
1/200	99.5%	120	500

- Using previous approximations, examine the implied parallel shifts on your asset & liability portfolio for reasonability, compared to:
  - Your expert's views (documented, of course)
  - Historical movements in yields at your asset & liability durations
  - Other sources of risk modelling (fund manager VaR's etc)

Market Risk validation: table discussion

- What are the biggest challenges to developing validation of the market risk in your organisation
- Does an approximation type approach, such as the example, help you in trying to validate market risk?
- What would be the main issues with this type of validation for market risk, and are there other forms of validation which would mitigate them.
- How could these techniques be extended to cover validation of the exchange rate and spread & migration risk modelling?

TABLE DISCUSSIONS

Table discussions playback

- Calibration
  - Historical movement in ULRs
- Dependencies
  - Underwriter questionnaire
- Reserving Risk
  - Bootstrap

Table discussions playback

- Premium ex cat
  - Drivers / statistical / qualitative
- Catastrophe
  - Coverage of all perils
- Market Risk
  - Using approximations

VALIDATION REPORT

Validation Report – Recap on timings

Version	Submission Deadline
Draft	***September 30***
Final	***December 16***

- Validation Report is a key component of the Final Application Pack (submitted in December)
- The purpose of the Draft Validation Report is to allow Lloyd's to provide feedback on Agent validation processes and results, in time for inclusion in the December submission

The Draft Validation Report

- Does not need to be complete…
- …but should contain enough that useful feedback on the approach can be given
- Lloyd's suggests that this means showing the following:
  - The *"breadth"* of validation – i.e. the areas that will be considered in the final report
  - The *"depth"* of validation – i.e. covering at least one material area of validation from end to end
  - Sufficient content on validation of the most *material risks* (e.g. one class of business complete for insurance risk)

The purpose of the Validation Report

- This is a report to ***Agent Boards***
  - Should contain enough information for Boards to get comfort…
  - …but will necessarily summarise underlying detail
  - The detail is still needed – it should be referenced in the report and available for review if requested
- This is to allow Agent Boards to discharge their ***responsibilities in applying for authorisation*** for the internal model
  - Model output needs to be fit for purpose
  - Model needs to meet regulatory standards (in all areas - e.g. around assumptions, methods, data, use, governance etc)

Aims for the Validation Report

The Validation Report should:

- be the ***starting point for understanding the validation*** of your model
- contain ***all the information that the Board needs*** on validation
- demonstrate (at an appropriate summary level) ***why the Board should have comfort*** in model
  - ***summarise the completed work*** – tests, results and conclusions
  - describe ***material limitations*** that have been identified in the model and its results
  - describe ***key sensitivities / judgments***, and demonstrate due process
  - demonstrate ***sufficient objective challenge*** for key parts of the validation process
- be ***linked to tangible metrics*** that the Board will understand
  - e.g. % chance of making a loss, total loss at 1/10yr, gross loss ratios and recovery rates at the 1/200 etc

Contents of the Validation Report

- These aims have been translated into the “Example Validation Report Contents” in the Validation Report guidance
- This contents is not mandatory - Agents should look to achieve these aims in the way that is most effective for their own Boards
- Lloyd’s will expect Board members to have a understanding of models and the Validation Report
  - Boards should expect some challenge from Lloyd’s over the key themes identified in this respect
- Confirmation statements* are an important part of Validation Reports
  - Lloyd’s is looking for evidence that Boards have considered whether the scope and extent of validation work is sufficient…
  - …so a level of positive assurance is required

*Refer to guidance on the Validation Report (July 2011) for details

Confirmation Statements - Practical considerations

- Agents should consider the following points when making confirmations:
- Enough work has been done to provide a reasonable (positive) conclusion on the quality of the model and results
  - Methodologies fit the risk profile
  - Judgments transparent, well evidenced and subject to sufficient challenge
  - Alternatives have been considered
  - Limitations are understood by management and users of output
- Requirements have been interpreted practically, and proportionality has been applied appropriately. Sufficient evidence of compliance is available
- Policies have been applied consistently and governance has functioned well

The appendix to these slides (available on lloyds.com) contains some practical thoughts on each of the confirmation statements

Who is signing your Validation Report

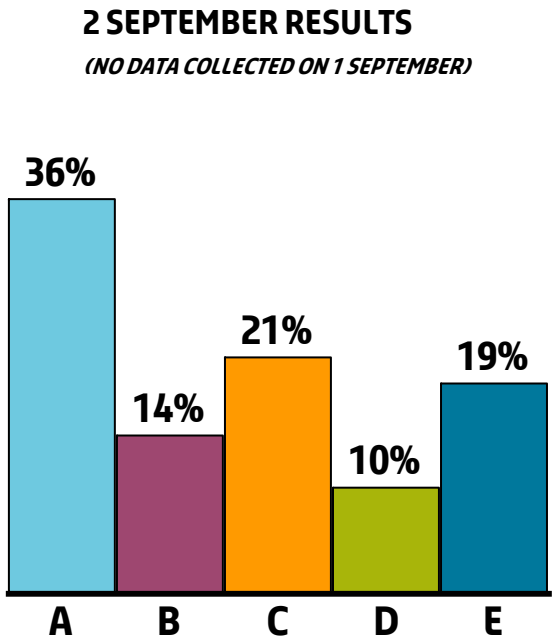
A. CRO / Head of Risk Management Function

B. Executive outside of Risk Function

C. Non-executive / Internal Audit

D. External party

E. Other / joint signatory



Signatory of Validation Report

- Signatory ***must be*** independent of the design and normal operation of the model…
  - *"The party performing the review […] must not have been significantly involved in the development and calibration of the internal model"* ***DOC 28/09 & FSA Contents of Application, section K***
- …but they don't need to repeat work, or do all the work themselves
- Lloyd's expects that Validation Reports will typically consolidate the work of a lot of individuals, some independent and some not
- The report must demonstrate ***adequate objective challenge***
- Validation Reports ***may not be the only document*** prepared in order to sign off the Internal Model
  - There may be, for example, non-independent sign-off within the capital team

Table Discussions: Independent Validation in Practice

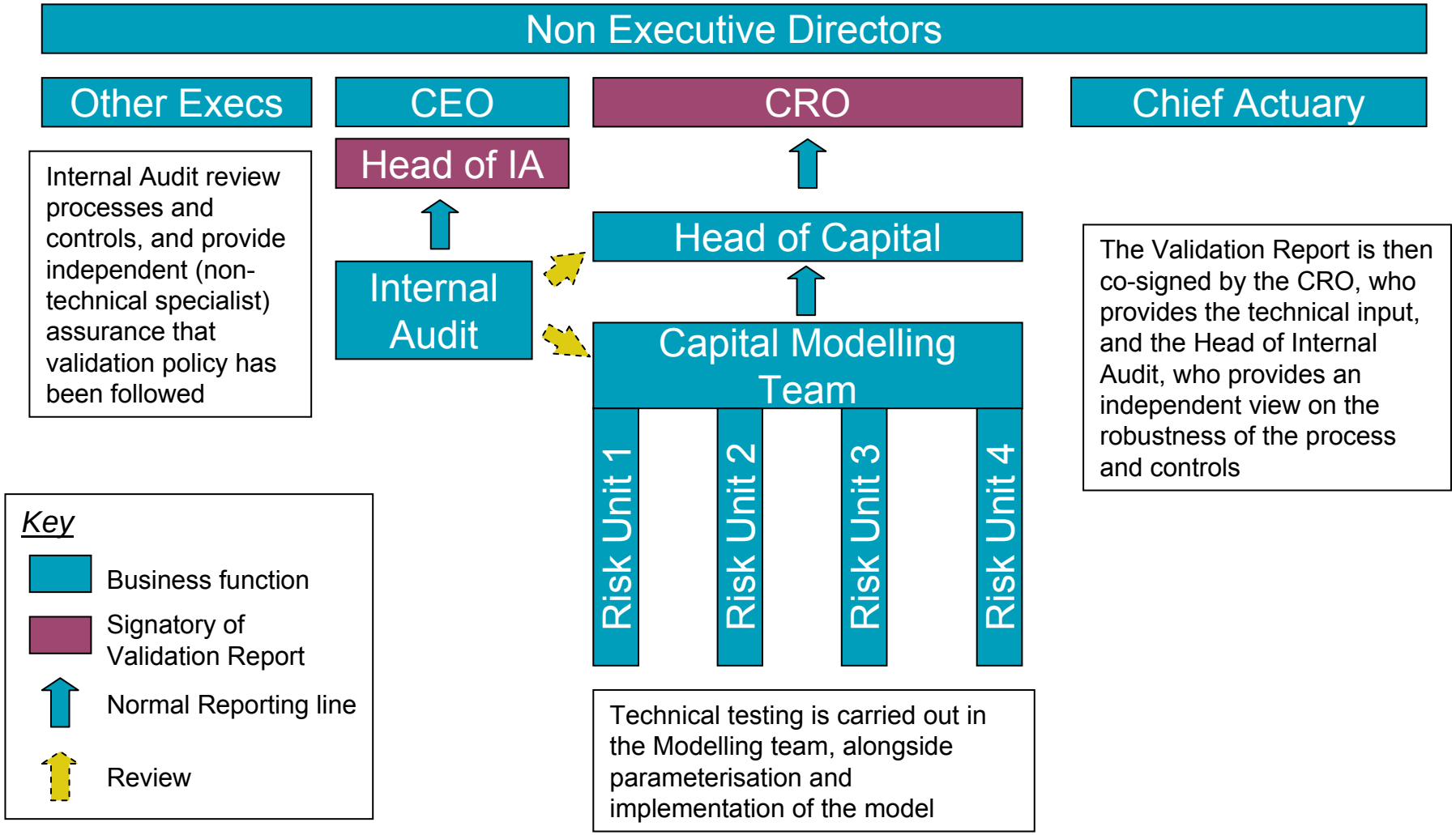
- Each table has 2 examples of how an example Syndicate might produce its Validation Report
- Compare these to what you are planning to do
- Consider the following questions:
  - Is the structure practical?
  - Does the structure provide sufficient technical knowledge to produce the validation report?
  - Does the structure provide sufficient objective challenge?
  - What is a potential pitfall of this structure, and how could you mitigate this?

Table Discussions: Independent Validation in Practice

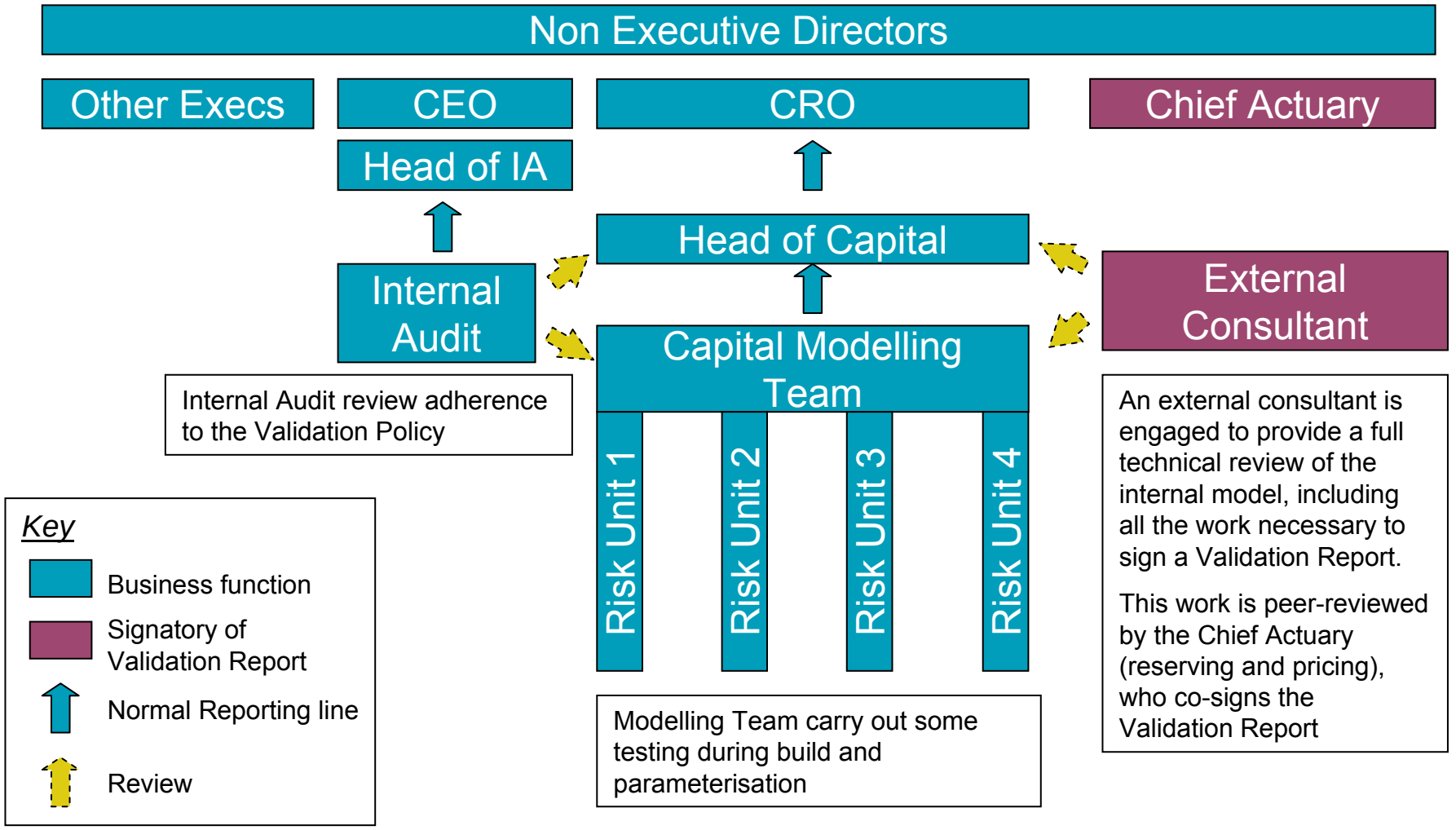
Feedback from table groups – Based on your discussions, please give:

- One key challenge for the Validation Report
- One potential pitfall
- One suggested piece of advice for Agents

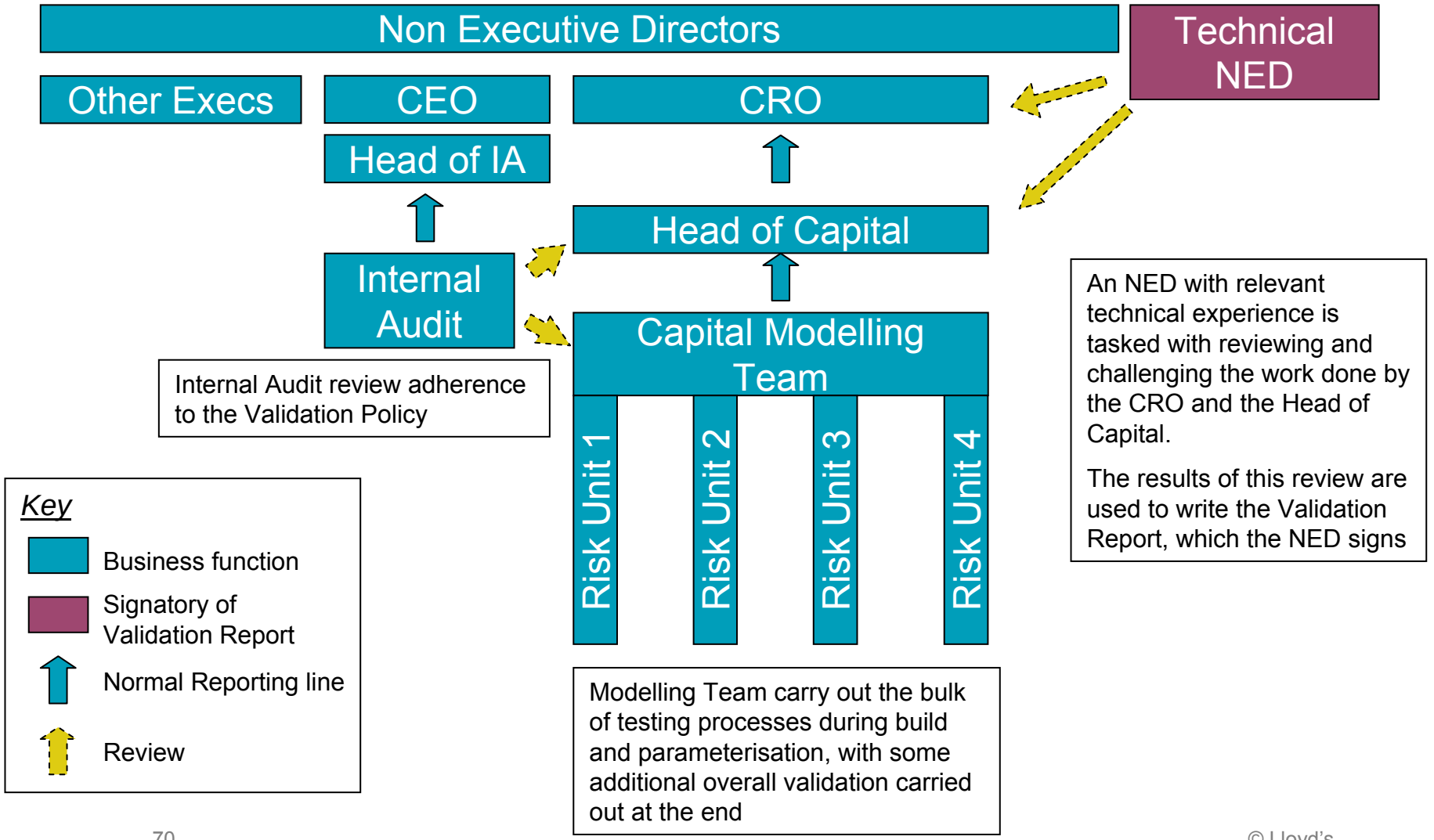
Validation Report in Practice - Example 1



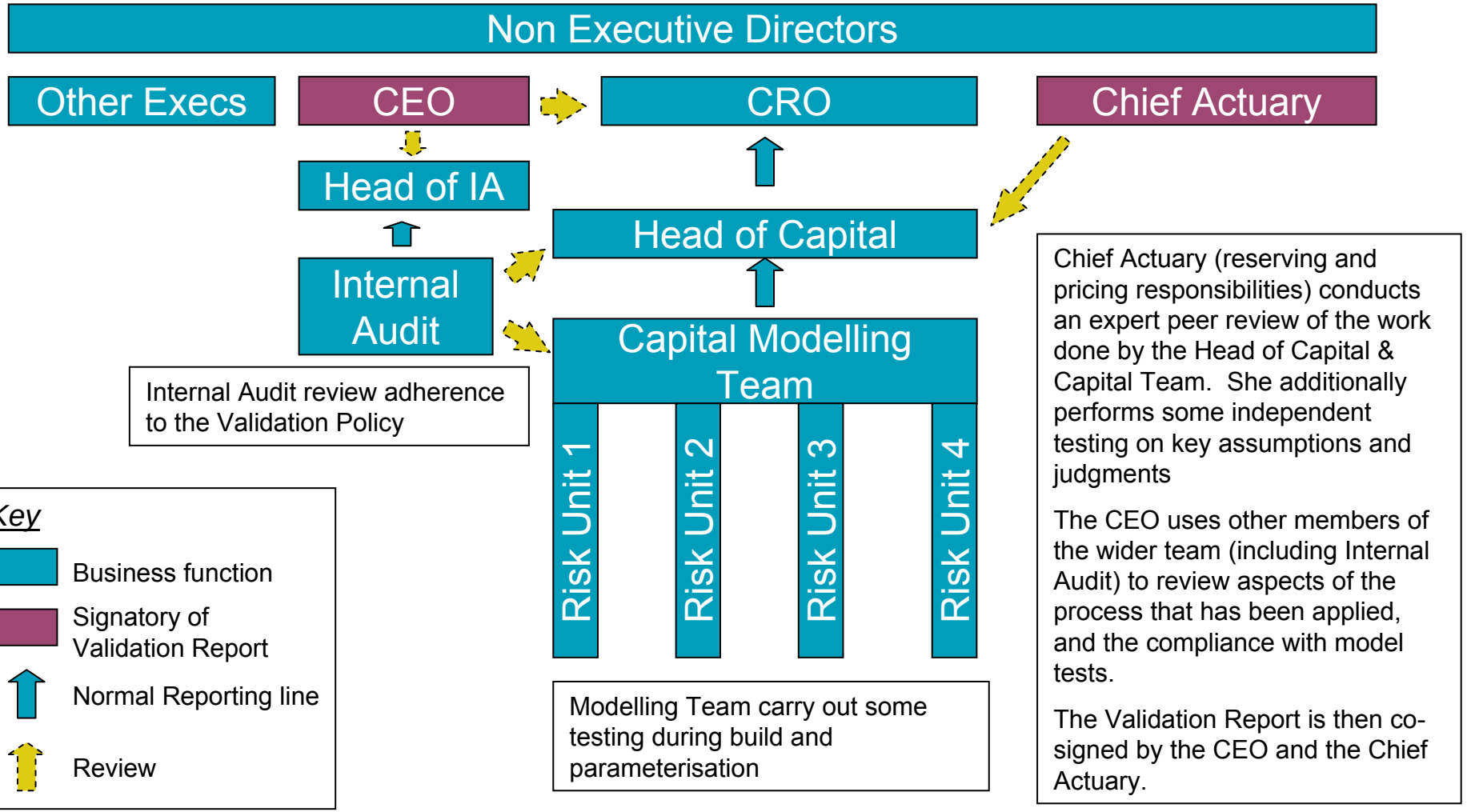
Validation Report in Practice – Example 2



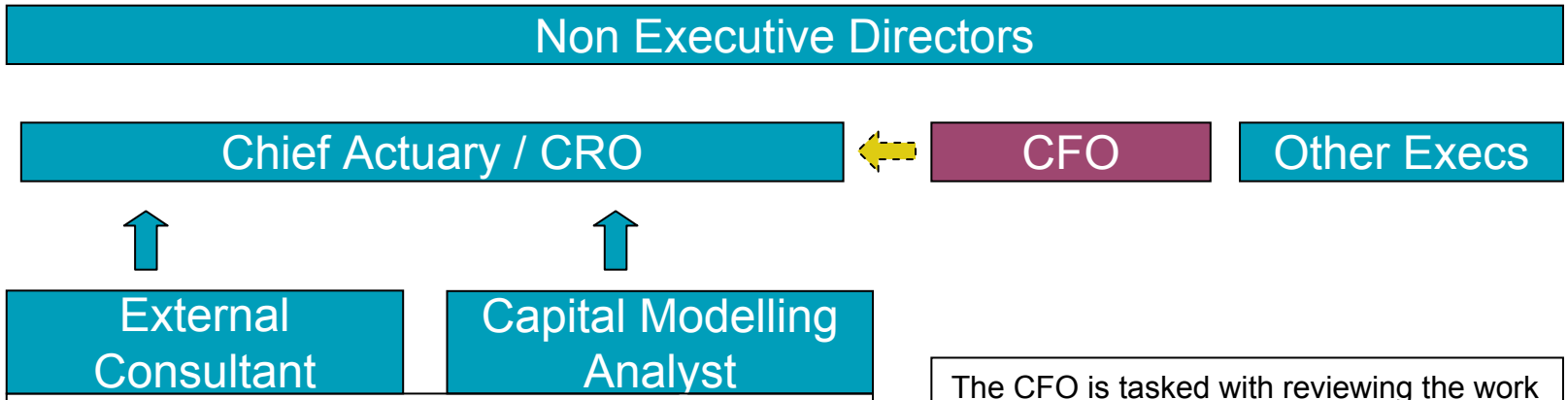
Validation Report in Practice – Example 3



Validation Report in Practice – Example 4



Validation Report in Practice – Example 5

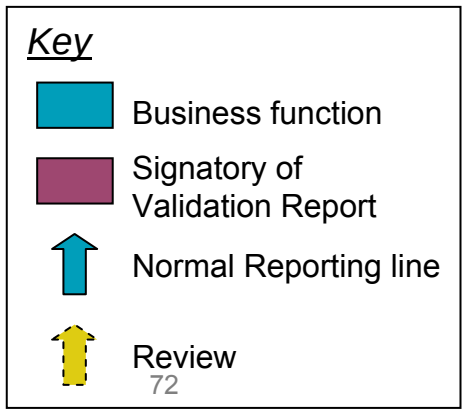


Modelling is largely performed by an external consulting firm, with some assistance from a single capital modelling analyst in the Agent. This is reported directly to the Chief Actuary (who is also the CRO).

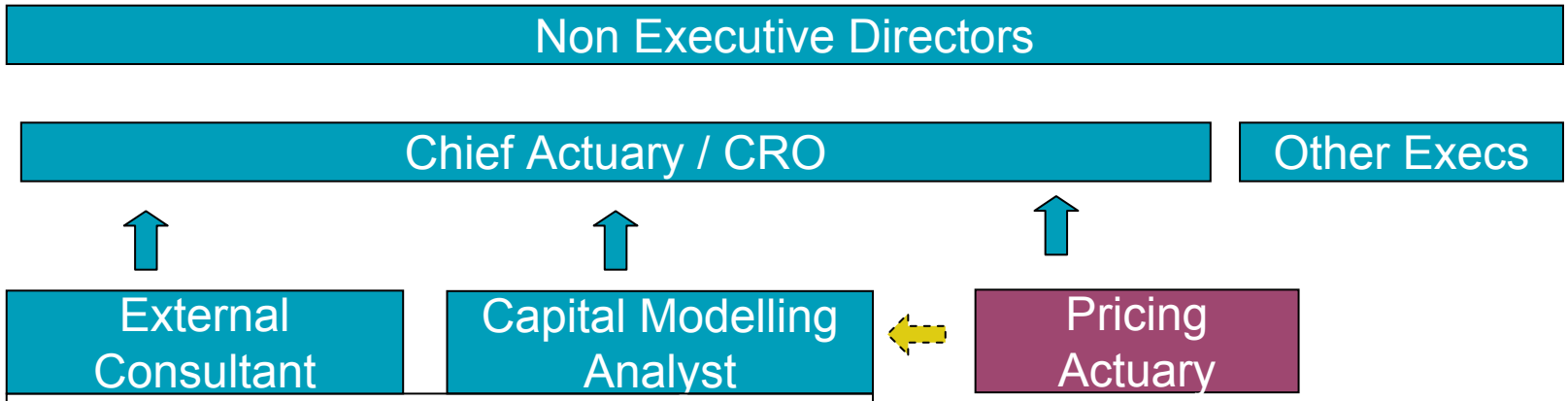
Almost all testing and validation processes are performed by the external consultant, although the Capital Modelling Analyst is involved in some business acceptance testing and day-to-day testing of the outputs

The CFO is tasked with reviewing the work done by the Chief Actuary, including the work that has been commissioned from the external consultancy, and ensuring that adequate objective challenge has been applied to key judgments and assumptions.

This review forms the basis of the Validation Report, which the CFO signs



Validation Report in Practice – Example 6



Modelling is largely performed by the single capital modelling analyst in the Agent, although there is some support on software programming from an external consultant. This is reported directly to the Chief Actuary (who is also the CRO).

Testing processes are carried out by the Capital Modelling Analyst , who is also responsible for the day to day running of the model

The Chief Actuary identifies a Pricing Actuary as having appropriate technical knowledge to peer review the work done by the Capital Modelling analyst (and to some extent the External Consultant)

The Pricing Actuary is then responsible for writing the Validation Report, based on this review

Key

- Business function
- Signatory of Validation Report
- Normal Reporting line
- Review

Independent Validation in Practice

- ***Many structures are possible*** – each will have its own advantages and disadvantages
- Most sensible structures can be acceptable, ***as long as they have sufficient safeguards*** in place
  - e.g. the CRO (model owner) could not sign individually, however a co-signatory approach may work to ensure independence
- There is ***no mandated approach***
  - it is for Agent Boards to determine the appropriate way of getting independent review of their model…
  - …and to ensure that this is demonstrably adequate
- Speak to your account manager for feedback on specific details
- Practice ***will evolve over time*** – this is not a one-off requirement

WRAP UP

What happens next?

- Slides will be made available on lloyds.com after both workshops
- Validation walkthroughs – feedback will be finalised in September
- No more workshops planned on Model Validation
  - is there still something you would like us to cover before the end of the year?
- Other upcoming sessions:
  - Valuation & Balance sheet and Reporting & Disclosure – 14 & 15 September
  - Documentation & Final Application and ORSA – 3 & 4 October
- Finally, before you go, a request for feedback ...

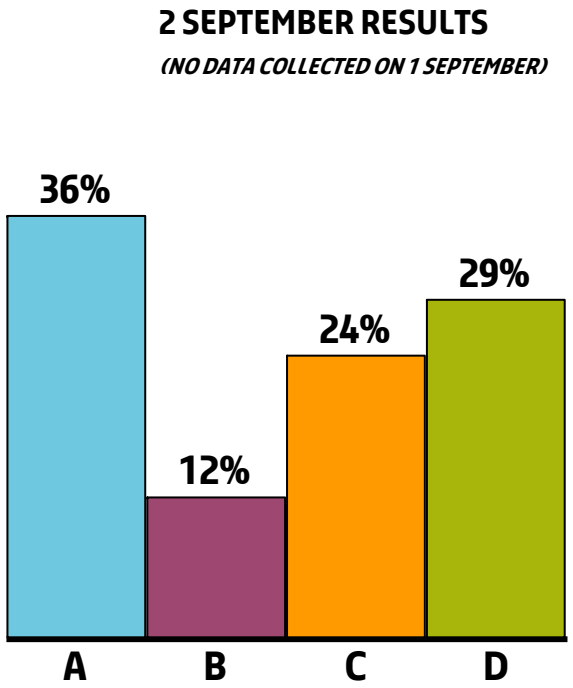
Would you like another Validation workshop to be arranged?

A. Yes – there are more areas that I would like to be covered

B. Yes as I can't imagine a life without workshops

C. No – I don't require any further information on validation

D. No as I just couldn't take the excitement of more!



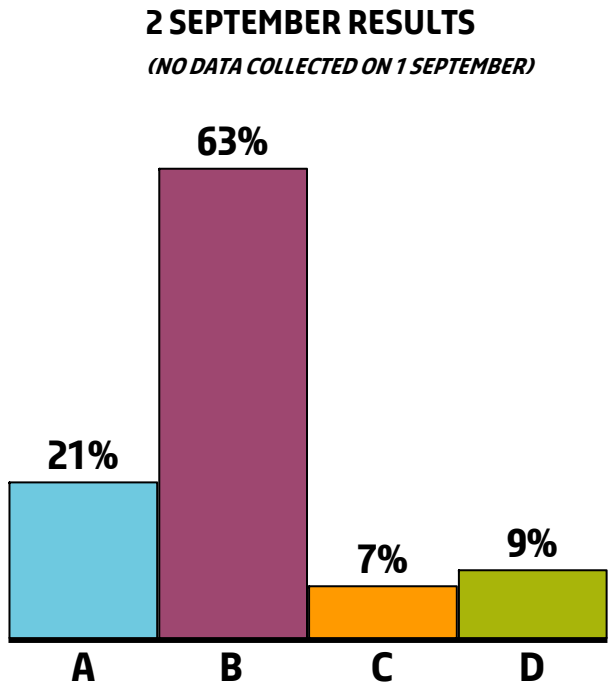
How useful have you found today's session?

A. Very useful and I have learnt something

B. Useful and we will use the slides for reference

C. Useful, but greater technical guidance would have been beneficial

D. Not very useful



How have you found format of today's workshop?

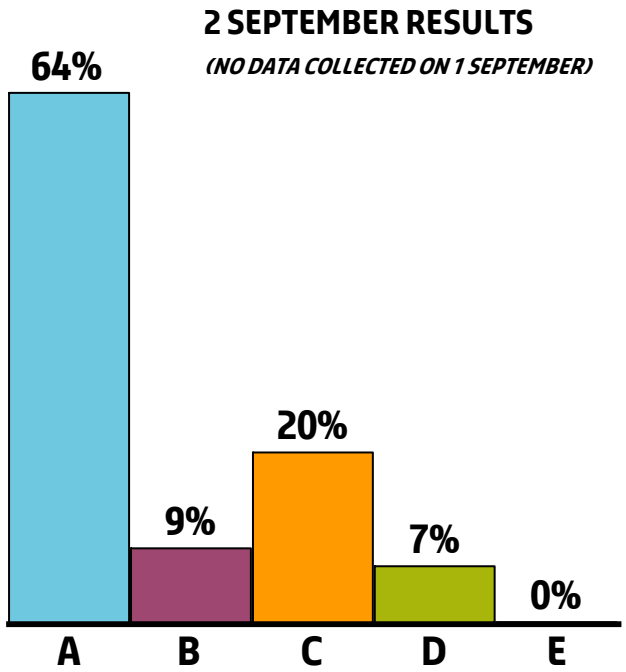
A. I liked having 2 discussion sessions and balance was good

B. I liked having 2 discussion sessions but they should be shorter

C. I would prefer to have only one table discussion

D. Would prefer less discussion and more presentation

E. Other




FIDENTIA

APPENDIX: VALIDATION REPORT

Confirmation Statements – practical considerations

"The SCR is calculated in line with applicable regulations and is not materially mis-stated"

- Methodologies appropriate for the business' risk profile
- There has been robust testing against alternatives
- Parameterisation reflects all relevant data
- Judgements and assumptions have been made in a transparent, unbiased way
- Limitations are understood and allowed for
- Validation work, subject to its limitations, is sufficient to conclude that the SCR is not demonstrably wrong

"The one-year to ultimate capital calculation is not materially mis-stated"

- Similar considerations, applied to the Lloyd's member capital number
- Expected to involve a reasonable amount of overlap in terms of validation process, although there are some key differences
- However, it does need to be addressed as a separate point, as the member capital number is important

Confirmation Statements – practical considerations

Key output information is appropriate for the business decisions it is used to inform

- The model has uses beyond the SCR (because it meets the Use Test)
- Business must be confident in relying on these numbers
- Nature and limitations of the output are understood by users

The internal model materially meets all relevant regulatory standards

- Demonstrable evidence of compliance with the 6 tests (Statistical Quality, Calibration, Validation, Use, P&L Attribution, Documentation)
- Consideration of the technical details in the Lloyd's dry-run requirements
- Consideration of what the requirements mean in practice,
- Appropriate application of proportionality
- Availability of evidence that tests are met
- Limited to standards relevant to the model – other requirements (e.g. General governance requirements) dealt with separately

Confirmation Statements – practical considerations

Validation has been conducted in line with the Validation Policy

- Evidence that the Policy (including any associated standards / procedures) has been applied in practice
- Tools and thresholds have been applied consistently and robustly across the model
- Governance over validation results has functioned appropriately and is evidenced

An appropriate level of independence has been maintained during the validation

- An objective view on the design and operation of processes and controls
- Ensure robust challenge to material assumptions and modelling judgments
- Avoid over-reliance on a single individual, and / or dominance risk in modelling
- Does ***not*** require complete re-performance of modelling